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In re Application of
Harari et al
Application Number: 07/337546 Filed:

Paper No. #40

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United States Patent Application Publication No. _____, page _____, line 17 of 2005
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703-418-2848
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United States Patent [19]
Harari et al.

[11] **Patent Number:** 5,418,752
[45] **Date of Patent:** May 23, 1995

[54] **FLASH EEPROM SYSTEM WITH ERASE SECTOR SELECT**

[75] **Inventors:** Eliyahou Harari, Los Gatos; Robert D. Norman, San Jose; Sanjay Mehrotra, Milpitas, all of Calif.

[73] **Assignee:** Sundisk Corporation, Santa Clara, Calif.

[21] **Appl. No.:** 963,851

[22] **Filed:** Oct. 20, 1992

Related U.S. Application Data

*[62] Division of Ser. No. 337,566, Apr. 13, 1989, abandoned.

[51] **Int. Cl.⁶** G11C 7/00

[52] **U.S. Cl.** 365/218; 365/185;
365/900

[58] **Field of Search** 365/185, 218, 900, 230.03

[56] **References Cited**

U.S. PATENT DOCUMENTS

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system design", Computer Design, Mar. 1, 1989, pp. 30 and 32.

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Attorney, Agent, or Firm—Majestic, Parsons, Siebert & Hsue

[57] **ABSTRACT**

A system of Flash EEPROM memory chips with controlling circuits serves as non-volatile memory such as that provided by magnetic disk drives. Improvements include selective multiple sector erase, in which any combinations of Flash sectors may be erased together. Selective sectors among the selected combination may also be de-selected during the erase operation. Another improvement is the ability to remap and replace defective cells with substitute cells. The remapping is performed automatically as soon as a defective cell is detected. When the number of defects in a Flash sector becomes large, the whole sector is remapped. Yet another improvement is the use of a write cache to reduce the number of writes to the Flash EEPROM memory, thereby minimizing the stress to the device from undergoing too many write/erase cycling.

4 Claims, 5 Drawing Sheets

